PTO/SB/30 (09-03)
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Request for Continued Examination (RCE) Transmittal	Application Number	09/683,685
	Filing Date	02/03/2002
	First Named Inventor	Aleksandar Susnjar
Address to: Mail Stop RCE Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Art Unit	2188
	Examiner Name	Kevin Verbrugge
	Attorney Docket Number	

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

- a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
  - i. ☐ Consider the arguments in the Appeal Brief or Rely Brief previously filed on _____
  - ii. ☐ Other _____
- b. ☑ Enclosed
  - i. ☑ Amendment/Reply
  - ii. ☑ Affidavit(s)/ Declaration(s)
  - iii. ☐ Information Disclosure Statement (IDS)
  - iv. ☐ Other _____

2. Miscellaneous

- a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
- b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

- a. ☐ The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. _____
  - i. ☐ RCE fee required under 37 CFR 1.17(e)
  - ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)
  - iii. ☐ Other _____
- b. ☐ Check in the amount of $ _____ enclosed
- c. ☑ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	ALEKSANDAR SUSNJAR	Registration No. (Attorney/Agent)	
Signature	*[signature]*	Date	SEP 01ST, 2004

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Name (Print/Type)	ALEKSANDAR SUSNJAR		
Signature	*[signature]*	Date	SEP 01ST, 2004

09/02/2004 KBETEMA1 00000026 09683685

01 FC:2801 385.00 OP

09/02/2004 KBETEMA1 00000026 09683685

02 FC:2251 55.00 OP

Request for Continued Examination

To facilitate further examination of my application please find the RCE
Transmittal (PTO/SB/30) and Credit Card Payment (PTO 2038 () forms enclosed.

The following are new claims to be entered into the application, with this RCE. I
hope that they are going to better formally describe what I claim to be the
invention than my original 19 claims.

Claim 20 (New)

A disk data storage device comprising of:
- one or more disks for storing data having track widths lesser than three
  times the maximum possible disk deformation in any direction,
- one or more actuators driving one or more head arms for each used
  surface,
- wherein at least two surfaces are used for storing any type of data,
- wherein each arm has a piezo-electric crystal-based fine head positioning
  system comprised of one or more such crystals to which heads are
  attached either directly or indirectly, such as via a lever, wherein the said
  crystals are controllably deformable to move the head in desired direction
  and distance,
- wherein the said fine head positioning system can move heads distant and
  precise enough to be able compensate for said deformations of disk
  material, deformations of actuator arm and deformations or production
  imprecision of any present components affecting relative positioning
  between the disks and heads or heads relative to one another,
- wherein the each of the said fine head positioning systems is
  independently controllable such that heads fitted on them can be
  independently moved into independent directions such that all the heads

on the same common actuator can be aligned on the same cylinder while maintaining the independence of heads on separate head arm actuators,

- wherein any or all of the heads available per surface can be used to read or write data on that surface, therefore having the ability to access data on any surface having at least one operational head for that surface,

- logic and/or circuitry controlling all available head arm actuators and all independent fine head positioning systems wherein this logic positions all the heads on the cylinder designated for each head arm during a seek operation and maintains this position on that cylinder until a new position is needed for heads on that particular arm,

- logic and/or circuitry capable of reading data from all (read) heads simultaneously and capable of writing data using all (write) heads simultaneously or being able to otherwise simultaneously use all heads for read and write operations,

- a communications interface through which the commands, responses and other data being read, written and/or otherwise important is being transmitted, and

- logic and/or circuitry controlling the entire device and capable of caching intermediate data, reading data recorded ahead of time in anticipation of it being requested and planning strategies of future operations, wherein this logic exposes the linear sector addressing mode not requiring the host to handle particular physical geometry of disks and recorded data

Claim 21 (New)

A disk data storage device of claim 20, wherein the recorded data is organized in such a way that two or more consecutive (sequential) logical sectors can be read or written at the same time, using different heads, whether the heads are on the same actuator arm or a plurality of available actuator arms, or both.

Claim 22 (New)

A disk data storage device of claim 20, wherein the logical sectors can be divided into two or more physical sectors that can be read or written at the same time, using different heads, whether the heads are on the same actuator arm or a plurality of available actuator arms, or both.

Claim 23 (New)

A disk data storage device of claim 20, wherein the data is physically recorded in such a way that data required to recover data stored in any physical sector not readable by one head, can be accessed by other available heads at the same time when the said inaccessible physical sector is passing under the head that cannot access it, whether the heads used to access the recovery information are located on the same or different actuator arms and whatever the cause is for the sector to be inaccessible, such as but not limited to head or surface damage.

Claim 24 (New)

A disk data storage device of claim 20, wherein the fine head positioning system is capable of placing some heads of any single actuator arm on one cylinder and remaining heads of the same actuator arm on another, neighbouring cylinder such that different surfaces of said two cylinders can be accessed simultaneously using different heads of any single actuator arm.

Claim 25 (New)

A disk data storage device of claim 20 with a plurality of heads for each surface driven by independent actuators and wherein the communications interface is capable of simultaneously sending the data read by any subset of all available heads to the host and receiving commands and/or data to write by using another,

non-overlapping subset of all available heads and being capable of executing the multiplicity of reads and writes simultaneously, using different heads.

Claim 26 (New)

A disk data storage device of claim 20 capable of multiplicity of different recorded data organizations affecting maximum sustained data transfer rates, latencies and access times, among which the host system can choose to best suit its maximum communication speed and usage profile.

Claim 27 (New)

A disk data storage device of claim 20 has enough internal buffer memory to store more than one entire cylinder worth of data and has read-ahead pre-buffering logic implemented to fetch the data from a plurality of heads simultaneously immediately after completing any seek operation without waiting or skipping sectors coming before the sector addressed by the operation requiring a seek, if any, or waiting for any other heads to complete any outstanding operation whatsoever, including seek.

Claim 28 (New)

A disk data storage device of claim 20 capable of sending data to the host out of order and fetching and transmitting the requested data out of order from a plurality of heads simultaneously immediately after completing any seek operation without waiting or skipping sectors that are not first or next in line to be fetched.

Claim 29 (New)

A disk data storage device of claim 20 capable of receiving data to be written from the host at data transfer rates higher than maximum data recording rates,

having an internal buffer to store this data and then record it in a different order than received to internally optimize the moving of all available actuators and fine head positioning systems.

Claim 30 (New)

A disk data storage device of claim 20 capable of:

- recognizing increasing discrepancies between readings of the same recorded data being read by a multiplicity of heads available on the same surface, therefore indicating a likely head failure, or
- detecting errors with all heads available for the surface, therefore indicating a likely surface or recorded data damage,
- automatically attempting to test the likely surface or recorded data damage by automatically recovering and re-recording the data and reading it again,
- automatically moving heads to test and attempt to repair different parts of recorded data at times the device is otherwise idle and not required by the host to perform operations, and
- automatically notifying the host of any detected errors as a device initiated event, without requiring the host to request the error reports.